Approximate solution of a nonlinear system of integral equations using modified Newton-Kantorovich method

ABSTRACT

Modified Newton-Kantorovich method is developed to obtain an approximate solution for a system of nonlinear integral equations. The system of nonlinear integral equations is reduced to find the roots of nonlinear integral operator. This nonlinear integral operator is solved by the modified Newton-Kantorovich method with initial conditions and this procedure is continued by iteration method to find the unknown functions. The existence and uniqueness of the solutions of the system are also proven.

Keyword: Newton-Kantorovich method; Nonlinear operator; Volterra integral equation; Trapezoidal rule; Convergence